

ABSTRACT OF THE INVENTION

According to one aspect of the present invention the fuel cell device includes an electrolyte sheet. The electrolyte sheet has a substantially non-porous body of a varied thickness, a relatively smooth surface and a more textured surface with multiple indentations therein, wherein the thickest part of the electrolyte sheet is at least 0.5 micrometers greater than the thinnest part of said electrolyte sheet. The side of the electrolyte sheet with a relatively smooth surface is subjected to the predominately tensile force and the other, more textured surface subjected to predominately compressive force. According to one embodiment, the fuel cell also includes one cathode disposed on the more textured side of said electrolyte sheet at least at least one anode disposed opposite the cathode on the relatively smooth side of aid electrolyte sheet. According to one embodiment, the relatively smooth side of the electrolyte sheet is the fuel facing side and the more textured side is the air-facing side